

REMARKS/ARGUMENTS

This case has been reviewed and analyzed in view of the Official Action dated 2 June 2004. Responsive to the rejections made by the Examiner in the outstanding Official Action, Claims 1 and 4 have been amended, and Claims 9 and 10 have been canceled in order to more clearly clarify the inventive concept of the Applicant.

The Examiner has objected to two specific instances of typographical errors in the Specification. The paragraph on Page 7, Lines 4-14, has now been amended to correct these typographical errors. The Examiner has further objected to Claim 4, specifically Line 2, because it is unclear how a single flange could be on an inner surface. Claim 4 has now been amended to overcome the Examiner's objections.

Prior to a discussion of the Examiner's further rejections made in the outstanding Official Action, it is believed that it may be beneficial to briefly review the subject Patent Application system in light of the inventive concept of the Applicant. The subject Patent Application is directed to a board-to-board connector. As shown in Fig. 2 of the Drawings, the board-to-board connector includes a first receptacle portion 1 and a second plug portion 3, with the board-to-board connector being modular. It is believed that the inventive and novel aspects of the invention lie in the formation and positioning of the terminal members, and Figs. 8 and 9 specifically show the first terminal 20 and the second terminal 40. The first terminal 20 includes a retention portion 23 having a barb 24 and projecting from a base 21. Referring to Fig. 9, the second terminal includes a base

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41 having a tail 42 projecting therefrom, a projection 45 also projecting therefrom, and a spring contact member 43 having a contact head 44. As shown in Fig. 3, when assembled, the spring contact head 44 is received within an engaging hole formed within wall 32. The engaging hole, shown better in Fig. 6, extends along a direction substantially parallel to the lateral axis of the plug housing 30. This allows for the contact head to easily and releasably engage the engaging hole.

The Examiner has rejected Claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over the Ito Patent #5,876,217 in view of the Olson Patent #5,310,357. It is the Examiner's contention that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the connector of Ito by forming the second spring contact portion with a projection which extends away from the second base portion, as taught by Olson, in order to increase the withdrawal force of the receptacle from the plug.

The Ito reference is directed to an electric connector assembly with improved retention characteristics. As shown in Figs. 2 and 9, each longitudinal sidewall 21 of receptacle housing 18 has a plurality of recesses 24 formed on its outer surface which are intended to engage the locking heads 16 of the terminal locking portions 15 of the plug connector component 4 when the plug and receptacle connector components 4, 5 are mated together. As best shown in Fig. 9 of the Drawings, the outermost edge of recess 54 abuts against the outermost edge of protrusion 21 in order to prevent terminal 19 from

moving inwardly. As shown in the Figure, terminal 19 rests on top of, and external to, the sidewall 21.

In contradistinction, in the system of the subject Patent Application, as shown in Fig. 3 of the subject Patent Application Drawings, the contact head 44 of the second terminal is received within an engaging hole formed in wall 32. Whereas the Ito reference shows a terminal head resting on top of and external to the sidewall, the system of the subject Patent Application utilizes a contact head which is actually received within a hole or recess formed within the wall. Thus, the system of the subject Patent Application, provides for a much more secure connection between the terminal and the retaining wall.

The Examiner has cited the Olson reference to be used in combination with the Ito reference, however, the Olson reference is merely provided because it shows a projection 140 formed on the second spring contact portion 118 extending away from the second base portion 152. The Olson reference does not teach or suggest a second terminal having a contact head which is received within a recess in order to form a more secure connection.

Neither the Olson reference nor the Ito reference, when taken alone or in combination, teach or suggest the use of a second terminal having a contact head projecting therefrom to be received within an engaging hole or recess of the sidewall of

the plug in order to form a more secure connection between the terminal and the plug member.

Thus, neither the Ito reference nor the Olson reference, when taken alone or in combination, provide for: "...each said lateral board having a plurality of engaging holes being formed therethrough, each said engaging hole extending in a direction substantially parallel to said lateral axis of said plug housing, each said engaging hole being formed in an upper portion of a respective one of said lateral boards...each said second spring contact portion having a contact head formed on a free end thereof for releasable engagement with a respective one of said engaging holes, each said engaging hole being in communication with a respective one of said second slots and a respective one of said lodged holes...", as is clearly provided by newly-amended Independent Claim 1.

Thus, based upon newly-amended Independent Claim 1, it is not believed that the subject Patent Application is made obvious by either the Ito reference or the Olson reference, when taken alone or in combination, when Independent Claim 1 is carefully reviewed.

The Examiner has further rejected Claims 8-10 under 35 U.S.C. § 103(a) as being unpatentable over the Ito reference in view of the Olson reference, as applied to Claim 1 above, and further in view of the Goto Patent Application Publication #2001/0027036. It is the Examiner's contention that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the connector of Ito by forming the

retention portion with a locking portion to be extended parallel with the first base portion, as taught by Goto, in order to provide more securement for the first terminal in the receptacle.

The Goto reference is directed to an electrical connector. As best shown in Fig. 3, the mating connector 30 is mounted on a surface of board P2. The outside form 32 of housing 31 is made to match the shape of the receiving space 14 of connector 10. A plurality of contact elements 40 are provided on the inside faces of receiving cavity 33. Each contact element 40 is stamped from a metal sheet in order to provide a contact section 41 supported on the inside face of the receiving cavity 33 and a leg section 42 extending outwardly from the contact section 41 to the outside of housing 31 to form a connection portion 42A which is level with or slightly higher than the bottom face 31A of housing 31. As shown in the Drawings, the lower portion of contact section 41 forms a hook-shaped member which engages a recess formed in the outside form 32.

In order to provide securement between the contact section 41 and the outside form 32, the recess for receiving the hook-shaped portion projects substantially upwardly and diagonally with regard to the bottom or base of the connector 30, as best shown in Fig. 3.

As described above with reference to Claim 1, neither the Ito reference nor the Olson reference teach a contact head region formed on the second spring contact portion for engaging a recess formed in the sidewall of the plug member. The Goto reference,

however, includes a hook-shaped portion on member 41 for engaging a substantially diagonal and upwardly extending recess.

In contradistinction, the system of the subject Patent Application includes an engaging hole or recess formed within wall 32 which extends in a direction substantially parallel to the lateral axis of the plug housing. As shown in Fig. 3 of the subject Patent Application Drawings, the contact head is received within the engaging hole which extends in a horizontal direction. The contact head region projects substantially 90° from the portion 43 of the second terminal. This allows for ease in assembly, replacement, and removal of the second terminal.

The hook-shaped head member of the Goto reference would provide either permanent securement of the second terminal, or, if the member needs to be replaced, extremely difficult removal of the second terminal due to the hook-shape of the connecting head and the diagonal placement of the recess or hole.

In the system of the subject Patent Application, the horizontal placement of the engaging hole allows for easy insertion and removal of the contact head of the second spring contact portion, which greatly enhances the replaceability and ability to repair and assemble the terminals within the board-to-board connector.

Thus, neither the Ito reference, the Olson reference, nor the Goto reference, when taken alone or in combination, provide for: "...each said lateral board having a plurality of engaging holes being formed therethrough, each said engaging hole extending in a

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direction substantially parallel to said lateral axis of said plug housing, each said engaging hole being formed in an upper portion of a respective one of said lateral boards...each said second spring contact portion having a contact head formed on a free end thereof for releasable engagement with a respective one of said engaging holes, each said engaging hole being in communication with a respective one of said second slots and a respective one of said lodged holes...”, as is clearly provided by newly-amended Independent Claim 1.

Thus, based upon newly-amended Independent Claim 1, it is not believed that the subject Application is made obvious by either the Ito reference, the Olson reference, or the Goto reference, when taken alone or in combination, when Independent Claim 1 is carefully reviewed.

It is now believed that the remaining Claims 2-8 show patentable distinction over the prior art cited by the Examiner for at least the same reasons as those previously discussed for Independent Claim 1.

The remaining references cited by the Examiner, but not used in the rejection, have been reviewed, but are believed to be further removed when patentable distinctions are taken into account than those cited by the Examiner in the rejection.

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It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

Respectfully submitted,



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